

Expanding the Universe of Design:

Applying a Neuro-Architectural Process to Create Accessible Cities
University of Arizona, Tucson

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Expanding the reach of design, and designers.



Innovative, immersive & interactive CAVE design.



Brain, body & behavioral responses to design.

An innovative curriculum based upon iterative interaction among architecture students, educators, and individuals with disabilities, will integrate the emerging fields of 'Neuro-Architecture' and 'Research-based Design' to explore the influence of design on brain, body, and behavior.

Architects and their clients now increasingly ask for rigorous and trustworthy data to support their design decisions. The proposed studio courses will be taught to sixty-eight B.Arch undergraduates as part of their 3rd year design studio sequence. A novel neuro-architectural process, integrated with universal design principles will demonstrate how to 'put the evidence' in evidence-based design. This approach is derived from pilot curricula as well as a background in research and clinical practice in neuroscience (Ph.D., University London), architectural design (M.Arch., NewSchool of Architecture & Design) and anthropology (B.A., University of California, Berkeley). The pedagogic methods and course objectives reflect work with educators, architects and scientists, providing a means for undergraduate architecture students to learn to access, interpret and apply information about the mental, physical and the phenomenological response to design.

The courses will be based upon a collaborative pilot study in which curricula was tested with students enrolled in environmental architecture courses who were introduced to the concept of universal and accessible design for a real-world client with multiple sclerosis. Design projects also focused on an educational institution that serves students and faculty with a broad variety of cognitive and physical needs. This included several parallel processes, from conducting critical analysis of clinical research to translating findings into design principles. The integration of the scientific method of inquiry and the neuro-architectural process tested the interaction between sensory, motor, hormonal, cognitive and emotional responses which are then translated into design principles to inform design features for the individual, group, public, and social context. A follow-up survey and the analysis of features incorporated in student designs yield an appreciation for authentic learning experiences and an influence on the architecture students' desire to enhance design outcomes.

The collaborative studio offered includes contributions from Paul Reimer, Coordinator of the 3rd year B.Arch. undergraduate design studio. Our faculty span architecture, planning, and landscape architecture, adding richness to study of how built settings may serve a city, a space or a place that is accessible in terms of universal principles and a broad range of physical, cognitive and social functions. In addition, faculty and students invited from the University of Arizona Disability Resource Center will meet in the studio, offering the perspectives of individuals with disabilities who used a variety of assistive technologies for mobility, navigation, environmental controls, and cognitive performance, etc. The insights shared by guest presenters (Dr. Caren Sax, San Diego State Univ.), studio discussions and jury critiques will enhance problem-based authentic learning. Our colleagues from the Center for Integrative Medicine, College of Medicine, and the Institute for the Environment at UA, who are now creating the Institute on Place & Wellbeing, expand this perspective to include the design of spaces that serve both health and wellbeing. By training design students in the scientific method, the mode of critical analysis and design research will expand to translate evidence from a broader range of disciplines, and beyond a narrow 'universe of design.'

Expanding the Universe of Design:*Applying a Neuro-Architectural Process to Create Accessible Cities*

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04.01.13-17:08 **The Berkeley Prize,
Department of Architecture,
University of California, Berkeley**
info@berkeleyprize.org

DEAR BERKELEY PRIZE COMMITTEE: As the Director of the School of Architecture at the College of Architecture, Planning and Landscape Architecture at the University of Arizona, Tucson, I am pleased to provide my enthusiastic support in the attached proposal for the Berkeley Prize Teaching Fellowship for 'The Architect and the Accessible City'.

We are uniquely positioned to offer innovative curricula to advance the cause of social architecture. Our faculty includes Dr. Eve Edelstein, a leader in the emerging fields of neuro-architecture and research-based design, as well as leaders in city planning, architecture and landscape architecture. Together with the Center for Integrative Medicine of the College of Medicine, and the Institute of the Environment, we are launching the Institute on Place and Wellbeing, collaboration focused on creating built and green environments for health and wellbeing. In concert with the University of Arizona's experts in Disability Services, we propose a practice-based learning pedagogy, with interactive discussion groups and iterative critiques to ensure that the students' design thinking reflect diverse needs of a broad range of users.

To this end, Dr. Eve Edelstein, PhD, F-AAA leverages her design background (MArch, NewSchool of Architecture & Design), clinical expertise (PhD Neuroscience, University of London), and ethnographic training (BA Anthropology, UC Berkeley). The innovative studio sequence enhances the neuro-architecture curriculum she currently teaches, and incorporates insights from previous universal design projects and courses taught with colleagues from the Academy of Neuroscience for Architecture, the AIA College of Fellows, and Dr. Caren Sax at the Interwork Institute, College of Education, San Diego State University.

Our college is pleased to provide the resources and infrastructure necessary to support these courses in third year B.Arch. studios during Fall and Spring semesters 2013-2014. Dr. Edelstein will team teach with Paul Reimer, a Lecturer and Coordinator of the ARC 301 studio, and Sue Kroeger, Director of Disability Services, at the University of Arizona. Discussion groups and studio critiques by invited faculty and students of the UA Disability Resource Center will enrich the experience, providing a breadth and depth knowledge about how the social and physical characteristics of design can better serve a diverse range of users. The addition of invited speakers including Dr. Sax, and field trips will extend the studio experience.



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BERKELEY PRIZE-EDELSTEIN_MILLERBERKELEY PRIZE-EDELSTEIN_MILLER

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I wholeheartedly support this exciting proposal that will enhance our common goals of understanding the impact of the built and natural environment on society and accessible cities.



SINCERELY **Robert Miller, Architect**
Professor, Director, School of Architecture

Expanding the Universe of Design:*Applying a Neuro-Architectural Process to Create Accessible Cities*

Disability Resource Center

1224 E. Lowell Street
P.O. Box 210095
Tucson, Arizona 85721
(520) 621-3268 TTY/V
(520) 621-9423 Fax

April 1, 2013

To Whom It May Concern;

I write this letter in support of Dr. Eve Edelstein's proposal for the Berkeley Prize Teaching Fellowship. It is our goal at the University of Arizona Disability Resource Center to weave disability into the fabric of campus; of critical importance is to infuse disability into design curriculum. When we consider disability a sociopolitical construct, the environment then bears responsibility for the disability experience. Barriers in the environment often limit access for disabled people, relegating them to lesser participation and representation in communities. Our goal in collaborating on this project is to work with students and faculty in recognizing the opportunities they have to universally design spaces and how barrier-free design neutralizes the impact of disability and other diverse characteristics, in that a diversity of users may fully access all spaces.

Through our collaboration we will work to infuse a consistent and progressive representation of disability into design courses. We believe that individual accommodations and retrofitting spaces are not in line with sociopolitical thinking on disability and that we must consider universal access from the initial design phases. Specifically, our role on this project will be to consult with faculty and students on course content, assignments and outcomes. We will offer feedback on student projects and invite a diverse group of disabled students to offer their perspectives on how design impacts access.

We are enthusiastic about having a Berkeley Prize Teaching Fellowship at the University of Arizona and look forward to working collaboratively on this project.

Sincerely

A handwritten signature in cursive script, appearing to read "Sue Kroeger".

Sue Kroeger, Ed.D.
Director

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COLLEGE OF ARCHITECTURE + PLANNING
+ LANDSCAPE ARCHITECTURE

B.Arch. curriculum

	required CU					CU
	professional	technical	elective	elective	general education	
FOUNDATION (PRE-PROFESSIONAL PHASE)						
Fall 1						
ARC 101 foundation studio 1 + H+T MODULE		6				
ENGL 101 freshman english*					3	
MATH 112 college algebra*					3	
MATH 111 trigonometry*					2	
elective: tier 1 INDV or TRAD-OR-foreign language deficiency				3		
						17
Spring 1						
ARC 102 foundation studio 2		6				
ENGL 102 freshman english*					3	
PHYS 102 college physics*					3	
PHYS 181 physics lab*					1	
elective – tier 1 INDV or TRAD				3		
						16
MILESTONE 1 ^Δ						
PROFESSIONAL PHASE: CORE						
Fall 2						
ARC 201 design studio 1	6					
ARC 221 building technology 1 – structures 1	3					
ARC 241 design communications 1	3					
ARC 297m material fabrication 1	3					
ARC 326 site planning	2					
						17
Spring 2						
ARC 202 design studio 2 [⊖]	6					
ARC 227 architectural programming	2					
ARC 222 building technology 2 – materials and methods 1	3					
ARC 223 building technology 3 – environmental control systems 1	3					
ARC 231 history + theory of architecture 1	3					
						17
Fall 3						
ARC 301 design studio 3 [⊖]	6					
ARC 321 building technology 4 – materials and methods 2	3					
ARC 341 design communications 2	3					
ARC 232 history + theory of architecture 2	3					
elective – tier 1 gender/ethnicity				3		
						18
Spring 3						
ARC 302 design studio 4 [⊖]	6					
ARC 322 building technology 5 – structures 2	3					
ARC 332 history + theory of architecture 3	3					
ARC 397m material fabrication 2	3					
elective – tier 1 NATS				3		
						18
Fall 4						
ARC 401 design studio 5 ^{⊖⊖}	6					
ARC 421 building technology 6 – environmental control systems 2	3					
ARC 471s history + theory of architecture 4	3					
ARC 441 contract documents [⊖]	3					
elective – tier 1 INDV or TRAD				3		
						18
MILESTONE 2 ^Δ						

notes

* Pre-requisites for application to Professional Phase

⊖ requires "C" or higher in preceding studio.

⊖ ARC 441 + ARC 401 taken concurrently

Δ Continuation requires passage of Milestone

Expanding the Universe of Design:*Applying a Neuro-Architectural Process to Create Accessible Cities***ARC 301: NAAB Criteria A2, B5, B6, C1, C6**Design Studio -
6-CU, Fall 2013School of Architecture, CAPLA
University of Arizona**FACULTY**Paul Reimer, Coordinator
Paul Weiner Cade Hayes Luis Ibarra Eve Edelstein**FULFILLMENT**

This course satisfies the requirements for the fifth course in the ten Design Studio sequence.

PREREQUISITES

Arc 202 'Dwelling' Design Studio

CONTACTCourse meets Monday, Wednesday, and Friday from 1:00 to 4:50 pm.
Field trips outside of scheduled class time will be a part of the course pedagogy.**COURSE DESCRIPTION**

The context for the studio explorations will be architectural assignments that engage the urban condition. Students will have an increased understanding of the relationship between architecture and the physical and cultural realities of the intended users.

More specifically, we will be looking at two specific project types, and how they invite / engage the plurality of urban users in a universal and inclusive way. This Studio focuses on the nature of materials and the constituent parts of structural and enclosure systems as they relate to one another, and to their role in ordering space, light, and human occupation. Particular emphasis will be placed on the intersection of elements (joints), assembly configurations (space), and their role in mediating between interior and exterior conditions (enclosure and operation). Modes of inquiry will focus on precedent study, physical modeling, material manipulation, light studies, and orthographic drawings (with an emphasis on wall sections). Course material is intended to be addressed iteratively with a pedagogical emphasis placed on critical group discussion, along with verbal, graphic, and physical modeling communication strategies.

PROJECTS

Each assignment will be graded on the basis of the rigorous development of conceptual, developed, and executed proposals, in addition to participation in classroom assignments, discussions, and during reviews. Exercises for this course will be of two types: Assignments – Design problems of varying duration focusing on multiple, simultaneous inquiries relating to overall building design. Probes – Design problems of short duration focusing on specific components of buildings, typically relating to joints between various elements of structural and enclosure systems, or the interface between building and user.

Probe Intro I: Single Material Joint An inquiry into the character of primary building material and methods of fastening them together. Students will be assigned one of three primary building materials to explore.

Probe Intro II: Dual Material Joint Similar to Probe 1a, using two materials rather than one.

Assignment 1: Urban Transportation Infrastructure (Light Rail Waiting Shelter and Food Stand) Students will be given a design problem with a specific program and site, for which they are required to make a complete schematic design proposal.

Probe 1: Conceptual Joint Design Students will be required to develop a joint design for a salient condition within their Assignment 1 proposal.

Assignment 2: Urban Infill Building Students will be given a design problem with a specific program and site for which they are to generate a complete schematic design proposal, along with detailed proposals for

Probes 2a and 2b: Conceptual Joint Designs Students will be required to develop a joint design for one selected enclosure and one user interface condition, within their Assignment 2 proposal.

Materials in this course may be copyrighted. They are intended for use only by students registered and enrolled in the course and are only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further without the written permission of the instructor. They are provided in compliance with the provisions of the Teach Act: <http://www.copyright.com/Services/copyrightoncampus/basics/teach.html>. Students should refer to University copyright policies: <http://www.library.arizona.edu/help/tutorials/copyright/index.html>

Expanding the Universe of Design:*Applying a Neuro-Architectural Process to Create Accessible Cities***ARC 302: NAAB Criteria A2, B5, B6, C1, C6**Design Studio -
6-CU, Spring 2014School of Architecture, CAPLA
University of Arizona**FACULTY**Luis Ibarra, Coordinator
Paul Reimer Paul Weiner Jesus Robles Eve Edelstein**FULFILLMENT**

This course satisfies the requirements for the sixth course in the ten Design Studio sequence.

PREREQUISITES

Arc 301 'Tectonics' Design Studio

CONTACTCourse meets Monday, Wednesday, and Friday from 1:00 to 4:50 pm.
Field trips outside of scheduled class time will be a part of the course pedagogy.**CATALOGUE DESCRIPTION**

Design of small community institutions, celebrating and in symbiosis with two distinct ecological contexts, emphasizing environmentally responsive, responsible, resourceful proposals, harming the fewest things, and inviting to a broad range of potential user needs.

COURSE DESCRIPTION

This course explores how natural and human environments coalesce to create shelter, community and inspire; environmentally responsive and responsible proposals consuming few resources, harming the fewest things and focuses on how human environments are shaped by the features and challenges of site, human needs for shelter, community, inspiration, and inclusion.

The context for these explorations will be an architectural assignment that engages the land and its community of users. More specifically, we will be looking at one specific project type, and how it responds to landform and natural systems, and how that might invite / engage a plurality of users in a universal and inclusive way.

PROJECTS

Students will work in the design studio during class time and come fully prepared to participate in every class. Projects require significant investments of time beyond class time. The Studio is the single most important learning instrument available to the students, for this reason students are encouraged to work beyond class time in the studio. In addition to the time dedicated for group discussions, and individual desk critiques, the course will involve field trips outside of the studio environment as a class and independently. These field excursions are integral to the course. Students will be asked to carpool as much as possible. Other types of participation may be specified and scheduled within each assignment.

The course is structured around three general assignment types:

Probes - Are focused on innovation, abstraction, and investigation.**Projects** - Are focused problem solving and synthesis.**Journal Sketchbook** - Documentation of process (extra credit)**ASSIGNMENTS**

The progression between Probes and Projects is intended to remind students to think both poetically and pragmatically throughout the design process. The final project is introduced early and is administered iteratively through the semester to give the investigative assignments (Probes) context and to clarify their ultimate purpose and applicability.

PHENOMENA	<i>Waiting Room</i>	15	
RESEARCH	<i>Sustainability & Precedent</i>	5	
SITE	<i>Campus Design</i>	20	
MEANING	<i>Chapel</i>	15	
BUILDING	<i>Building Design (interim review)</i>	20	
SYNTHESIS	<i>Synthesis (final review)</i>	25	100%

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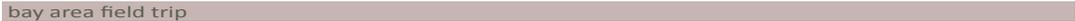
arc 301
 fall 2013

**CONSULTANTS
 ADVISORS &
 JURORS**

Dr. Caren Sax
 Co-Director
 Interwork
 Institute
 San Diego State

Dr. Sue Kroeger
 Director,
 Disability
 Resource Center
 University
 Arizona

**Dr. Amanda
 Kraus**
 Asst. Director,
 Disability
 Resource Center
 University
 Arizona

FALL week 1	Single Material Joint An inquiry into the character of primary building material and methods of fastening them together. Students will be assigned one of three primary building materials to explore.		
	probe intro I		
FALL Week 2	Dual Material Joint Similar to Probe Intro I, using two materials rather than one.		
	M	W	F
	probe intro II		
FALL week 3	Urban Transportation Infrastructure (Light Rail Waiting Shelter and Food Stand) Students will be given a design problem with a specific program and site, for which they are required to make a complete schematic design proposal.		
	assignment 1		
FALL week 4			
			
FALL week 5			
			
FALL week 6	Conceptual Joint Design Students will be required to develop a joint design for a salient condition within their Assignment 1 proposal.		
	probe 1		
FALL week 7			
	bay area field trip		
FALL week 8	Urban Infill Building Students will be given a design problem with a specific program and site for which they are to generate a complete schematic design proposal.		
	assignment 2		
FALL week 9			
			
FALL week 10			
			
FALL week 11			
			
			interim review
FALL week 12			
			
FALL week 13	Conceptual Joint Designs Students will be required to develop a joint design for one selected enclosure condition, within their Assignment 2 proposal.		
	probe 2a		
FALL week 14	Conceptual Joint Designs Students will be required to develop a joint design for one selected user interface condition, within their Assignment 2 proposal.		
			no class
		probe 2b	no class
FALL week 15			
			
FALL week 16			
	assignment 2 due		final review

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arc 302
spring 2014

PHENOMENA
Waiting Room
15
RESEARCH
Sustainability & Precedent
5
SITE
Campus Design
20
MEANING
Chapel
15
BUILDING
Building Design (interim review)
20
SYNTHESIS
Synthesis (final review)
25

SPRING week 1

'waiting room'

SPRING Week 2

M

W

F

SPRING week 3

SPRING week 4

site design

SPRING week 5

SPRING week 6

SPRING week 7

SPRING week 8

chapel design

SPRING week 9

SPRING week 10

(spring break)

SPRING week 11

sanctuary design

SPRING week 12

interim review

SPRING week 13

SPRING week 14

synthesis

SPRING week 15

SPRING week 16

final project due

final review